

Macular Microvascular changes in patients with Diabetes Mellitus using Swept Source Optical Coherence Tomography Angiography

Helena Haskaj, Bogdan Gregorčič,
Eye Department, General Hospital Nova Gorica, Ulica padlih borcev 13a, 5290 Sempeter pri
Gorici, Slovenia

Polona Jaki Mekjavić,
Očesna klinika, UKC Ljubljana, Grablovičeva 46, 1000 Ljubljana, Slovenia

Purpose

Swept Source optical coherence tomography angiography (SS-OCTA) is a new non-invasive imaging technique. This study aims to evaluate macular microvascular changes in patients with diabetes mellitus (DM) using SS-OCTA.

Methods

Prospective observational study of patients with DM and control age-matched healthy subjects that received 3 x 3 mm SS-OCTA imaging (DRI OCT Triton Plus, Topcon) in a three month period in the beginning of 2016 at the Eye department of General Hospital Nova Gorica. Microvascular changes in the macula were evaluated: capillary nonperfusion, microaneurysms, vessel beading and tortuosity. Size and irregularity of foveal avascular zone (FAZ) were measured and evaluated in the superficial and deep plexus layers in both groups.

Results

The study included 51 diabetic patients and 26 control age-matched healthy subjects. Most of the diabetic patients had type 2 DM. 72,5 % of patients showed no clinical signs of diabetic retinopathy. More microvascular changes were seen in patients with poorly controlled and longer duration of DM. Microaneurysms, venous beading and tortuous vessels were seen in both groups. More microaneurysms were seen in the deep plexus. FAZ remodelling and capillary nonperfusion was seen more often in diabetic than control eyes. Diabetic patients seemed to show FAZ enlargement compared with the control group, regardless the retinopathy. The difference was not statistically significant in every subgroup. Interpretation of SS-OCTA can be affected by imaging artifacts. Those images have to be excluded from the analysis.

Conclusions

SS-OCTA is able to image macular microvascular changes that are not visible on clinical examination of diabetic eyes, even before retinopathy develops. SS-OCTA could be useful to detect diabetic eyes at risk of developing diabetic retinopathy/maculopathy. The extent of its clinical applicability is yet to be determined. Ophthalmologists have to acquire knowledge and skills of SS-OCTA interpretation.

Financial disclosure: none